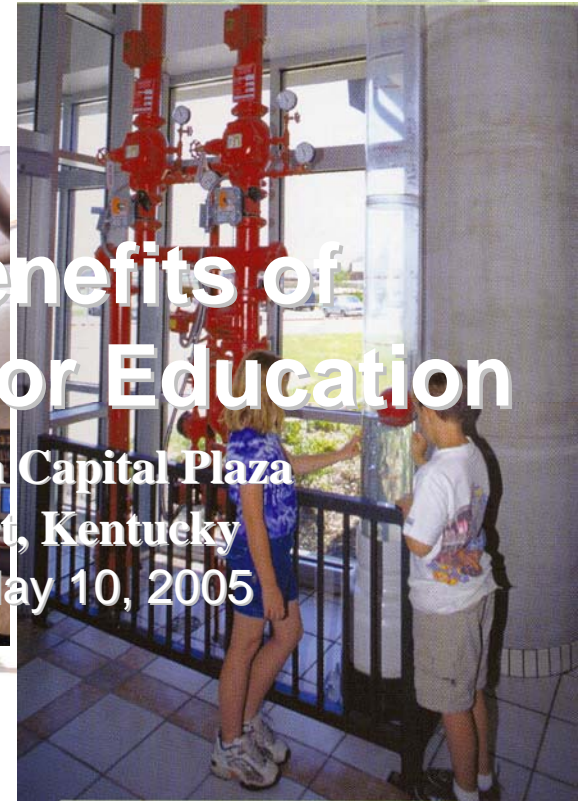


# High Performance Sustainable Schools



## The Benefits of Buildings for Education

Holiday Inn Capital Plaza  
Frankfort, Kentucky  
Tuesday May 10, 2005

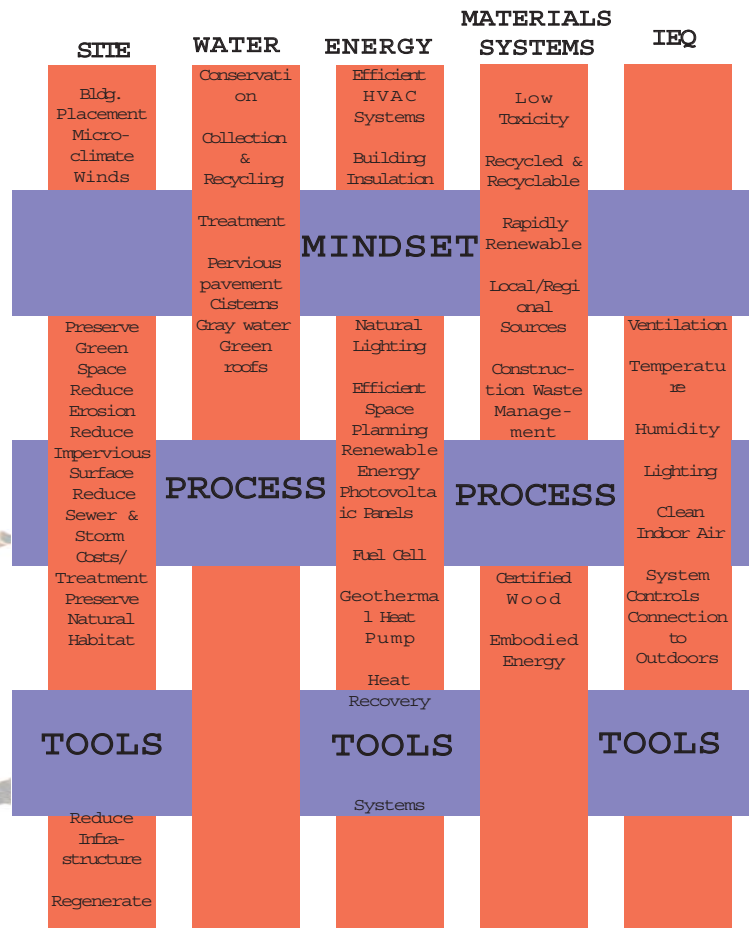


**Robert J. Kobet, AIA**

President, Sustainaissance International, Inc.

# What is Green School Design?

## Combining the Physical Environment and the Education Process



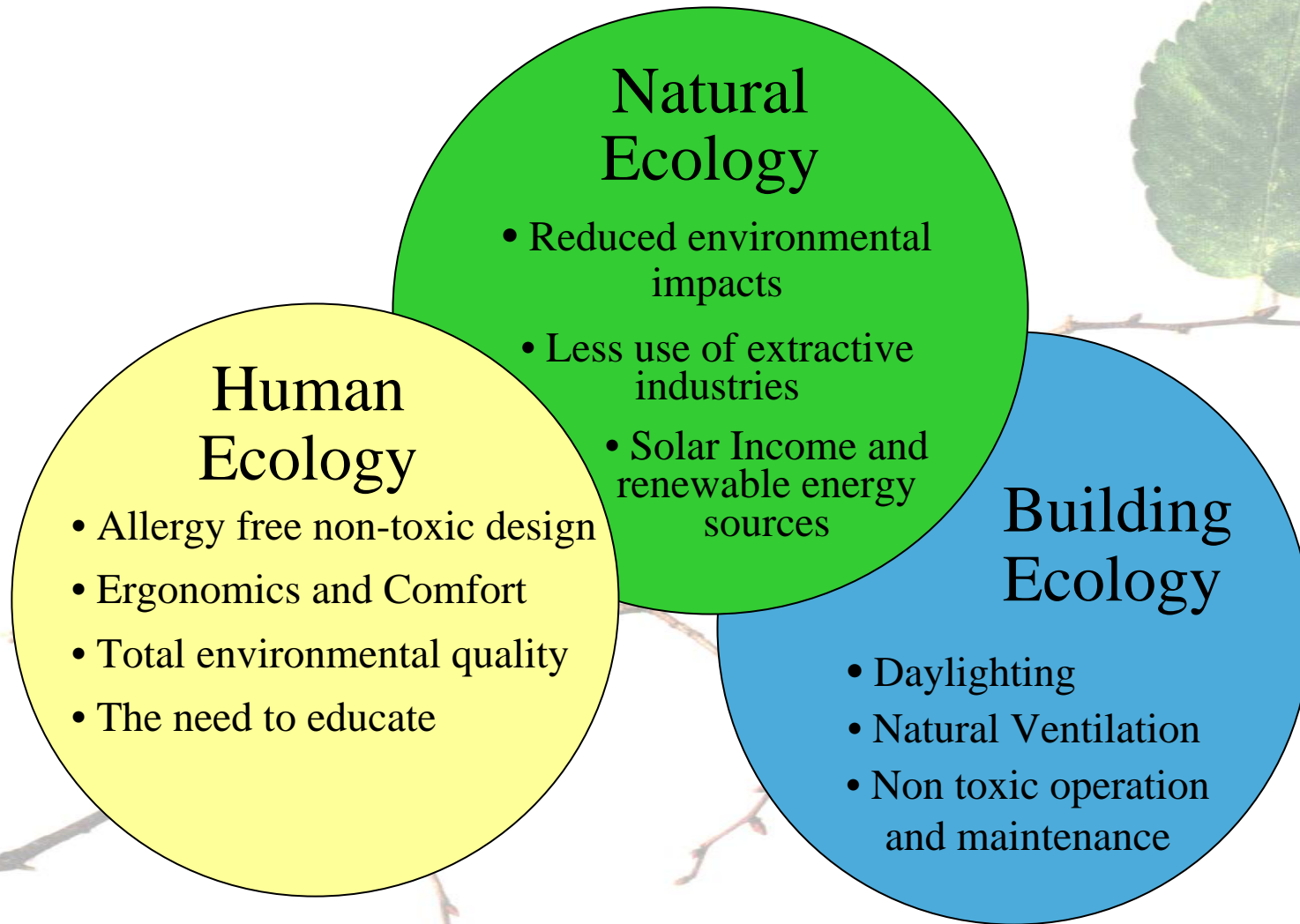
**First challenge - getting beyond the pieces.**

Weaving the tapestry of the Elements of school design with

pervasive Concepts in education with

The Education Delivery process.

# *High Performance Green Design Principles*





# Where are we going?

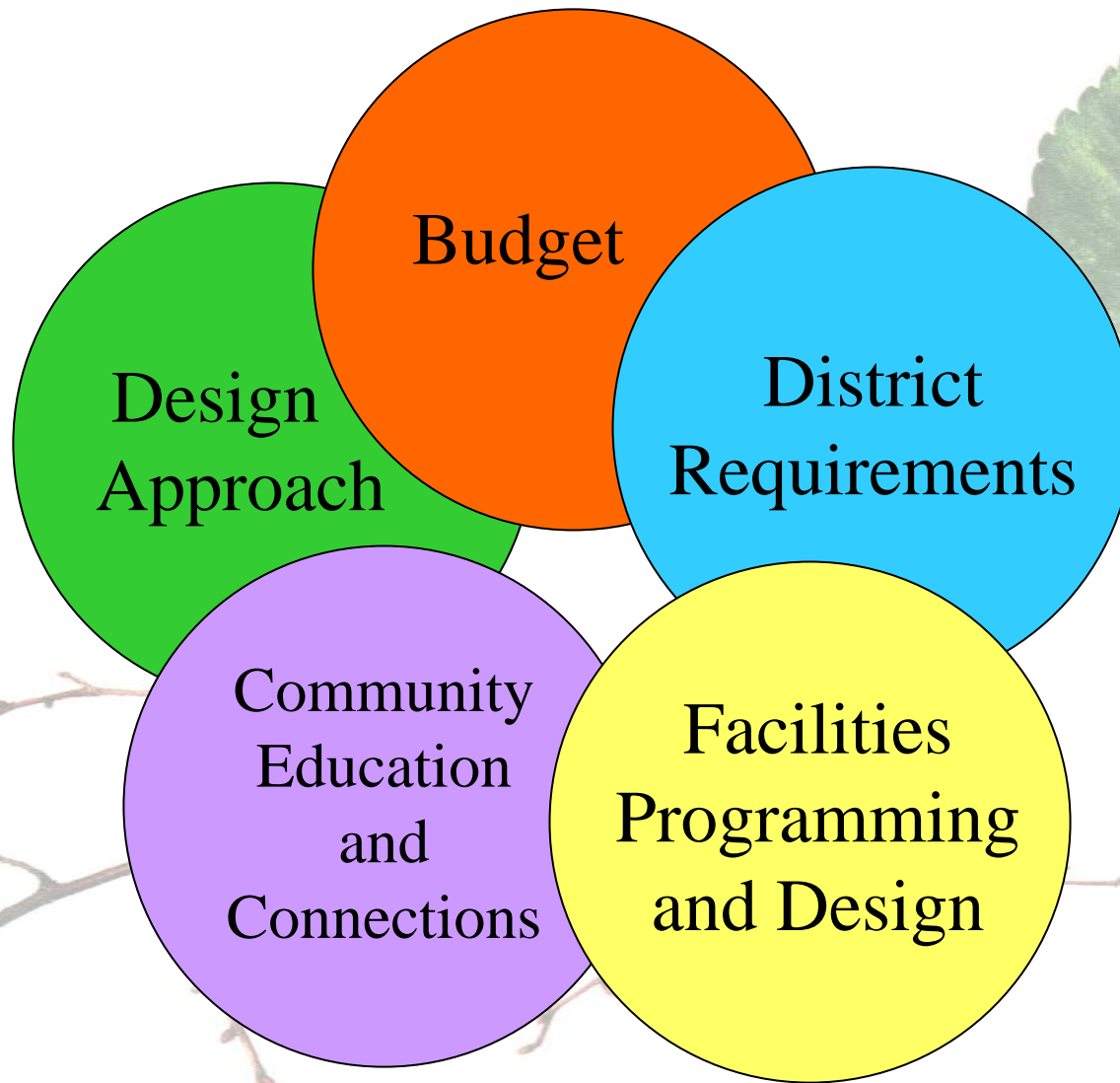
Are high performance green schools compatible with emerging trends ?



Schools are expensive and last a long time. When we build new schools or modernize new ones, it is important to consider how we think about and deliver public education. Although no one can predict the future, we have an obligation to identify evolving attitudes and practices and to try our best to understand how they might effect the physical settings we use for learning.

*Kenneth R. Stevenson, Ed.D*

# *Typical School District Issues*



*Typically vary with urban, suburban and rural districts*

*We are getting a lot of attention and a lot of scrutiny*

## *Progress Report on Sustainability*

*Building Design and Construction Magazine November 2044*

## *Building Healthy, High Performance Schools: A Review of Selected State and local Initiatives*

*The Environmental Law Institute*

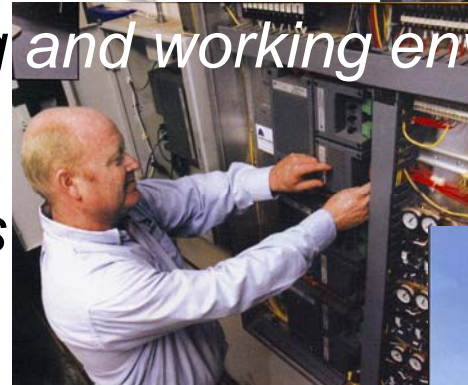
## *And a cast of thousands!*

*Environmental Protection Agency, the Department of Energy, the Council of Educational Facility Planners International, the American Institute of Architects, the Sustainable Buildings Industry Council, The US Green Building Council, the Collaborative for High Performance Schools, etc.*



# We know the benefits of High Performance Green Schools:

*Energy, Material and Resource Efficient*  
*Healthy and productive learning and working environments*  
*Effectively day lit*  
*Stimulating and pleasing places*  
*Acoustically superior*  
*Easier and less costly to operate and maintain*  
*Reflective of local culture and other institutions*  
*Community resources*  
*Great recruiting tools*  
*Flexible and adaptable*



# Did you know?



***Cocktail party conversation or  
critical life cycle cost information?***

- Each school day 50 million school children and 6 million adults enter our schools; each of whom are directly effected by the physical environment.
- 20% Of the US population suffer from allergies and a heightened sensitivity to airborne contaminants. – US EPA
- Children lose six million asthma days per year in K-12 schools. – US Department of Education
- Businesses lose 60 million work days per year due to problems related to indoor air quality – US EPA

*Is this stuff really important?*



# Have you ever heard of.....

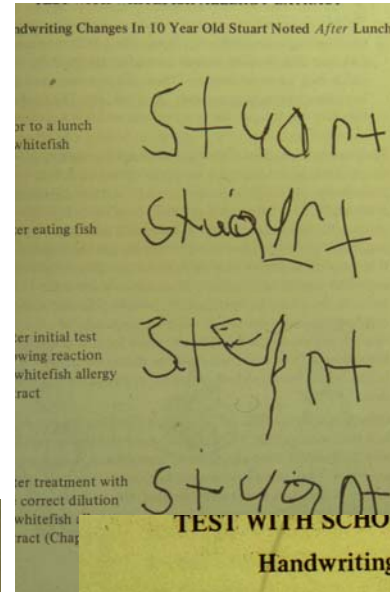


*Cocktail party conversation or  
necessary information?*

- Sick building syndrome
- Building related illness
- Multiple chemical sensitivities
- Phenocyclehexane (4pc)
- Formaldehyde (HCOH)
- Incitants of chronic illness
- Clinical ecology
- Green Architecture
- CHPS
- USGBC LEED™
- Eco-friendly interiors

*Do we understand the connections?*

# What do we need to know?



**Illustration 8**

**TEST WITH GRASS ALLERGY EXTRACT**

**Handwriting Changes In 5 Year Old Laura**

Before Test	During Test	After Grass Treatment
LAMBA	LAURA	LAMBA

This unusual reaction occurred during allergy testing for grass.\*  
How would Laura write and perform during examinations which happened to be scheduled during the grass pollen season in June? Could her writing change if she had recess or gym on a freshly cut lawn?

**TEST WITH SCHOOL AIR ALLERGY EXTRACT**

**Handwriting Changes In 9 Year Old Edward**

Before Test	During Test	After School Air Treatment
Edward	Edward	Edward

- Normal
- Withdrawn, throwing toys, headache, red ears, earache
- Ears less red, headache and earache gone, behavior appropriate

*The consequences are real*

# *Why Build High Performance Green Schools ?\**

- Better student performance
- Increased average daily attendance
- Increased teacher satisfaction and retention
- Reduced operating costs

*“I have noticed a big difference in my health since we’ve been in the new school. I had a lot of absenteeism – in fact I was hospitalized in the old building. In the new school, I won’t say I’m cured of asthma – I still have it and I still have allergies – but I really don’t have many problems at all and I’m feeling great.”*

Teacher at a new school in New Hampshire  
using the *Advantage Classroom* design concept.



# *Why Build High Performance Green Schools ?*



- Reduced liability exposure
- A positive influence on the environment
- Increased opportunities for using the facility as a teaching tool

*“High performance facilities are a critical part of the equation for improving student outcomes in this country.”*

*Jack Lyons*

*Educational Facilities Program Manager*

*U.S. Department of Education, retired*

*\*High Performance School Buildings*

**Sustainable Buildings Industry Council**

# *What are they saying?*

**From *Progress Report on Sustainability - Building Design and Construction*  
November 2004**

## *Progressive Districts Promoting High Performance Schools*

	Total	ASBO	CEFPI	NSBA
Yes, quite extensively	21%	13%	26%	8%
Yes, somewhat	49%	40%	53%	38%
No, but we plan to do so	11%	17%	12%	5%
No	20%	30%	9%	50%
Base	437	30	304	103

The overwhelming majority of school districts (81%) have used sustainable design or plan to do so, according to respondents.

	Total	ASBO	CEFPI	NSBA
Yes, quite extensively	21%	13%	26%	8%
Yes	38%	44%	41%	18%
No	5%	-	3%	14%
Don't know/Not sure	58%	56%	56%	68%
Base	296	16	236	44

The case for improved student performance in green schools has not been made, judging from these results, but anecdotal evidence is intriguing. One respondent wrote, "Standardized test scores rose fairly dramatically" after a year at one high-performance school.

***Have you incorporated  
sustainability in current school  
projects?***

***If you have used sustainable  
design in building projects has it  
improved student performance?***

# What are they saying?

From *Progress Report on Sustainability - Building Design and Construction*  
November 2004

## *Progressive Districts Promoting High Performance Schools*

### How familiar are you with?

...the term "sustainable design" or "green building"?

	Total	ASBO	CEFPI	NSBA
Very familiar	52%	27%	69%	12%
Somewhat familiar	30%	40%	27%	37%
Have heard of it	10%	30%	3%	24%
Never heard of it	7%	3%	1%	27%
Mean (scale of 4)	3.28	2.90	3.64	2.33
Base	435	30	302	103

...the CHPS Best Practice Manual?

Very familiar	16%	3%	22%	4%
Somewhat familiar	23%	13%	27%	13%
Have heard of it	28%	47%	25%	30%
Never heard of it	33%	37%	26%	53%
Mean (scale of 4)	2.22	1.83	2.45	1.67
Base	435	30	302	103

...LEED?

Very familiar	42%	17%	57%	8%
Somewhat familiar	26%	33%	29%	17%
Have heard of it	12%	27%	8%	21%
Never heard of it	19%	23%	6%	54%
Mean (scale of 4)	2.92	2.43	3.37	1.78
Base	434	30	301	103

CEFPI members displayed the highest level of familiarity with sustainability, CHPS, and LEED among the three groups surveyed

	Total	ASBO	CEFPI	NSBA
Very experienced	19%	3%	25%	7%
Somewhat experienced	42%	43%	47%	27%
Not much experience, but interested	27%	30%	23%	39%
No experience/ no interest	12%	24%	5%	27%
Mean (scale of 5)	3.66	3.20	3.90	3.10
Base	435	30	302	103

Most respondents (61%) said their school districts have some experience in green buildings, with another large group (27%) expressing interest

### How would you describe the level of expertise about green buildings in your school district?



# *What are they saying?*

**From *Progress Report on Sustainability - Building Design and Construction*  
November 2004**

## *Progressive Districts Promoting High Performance Schools*

	Total	ASBO	CEFPI	NSBA
Yes, but they're worth it	51%	47%	60%	28%
Yes, and they're not worth it	13%	17%	14%	8%
Green schools not more costly	10%	3%	12%	5%
Not sure	26%	33%	14%	59%

While the majority of respondents (51%) see sustainability as worth any construction premium, and another 10% see no added cost, a substantial group just aren't sure about additional added cost.

### **Do green school buildings cost more to build?**

	Total	ASBO	CEFPI	NSBA
Up to 5%	37%	10%	39%	39%
Up to 10%	29%	43%	30%	24%
Up to 15%	6%	10%	7%	3%
Up to 20%	5%	7%	3%	9%
>20%	1%	-	1%	2%
Mean	6.78	8.95	6.41	7.32
Median	6.26	8.31	6.02	5.50
Base	416	30	291	95
Not acceptable at any cost	14%	7%	14%	14%
Green buildings do not cost more to build	8%	23%	7%	8%

Surprisingly, school business officials showed the greatest support for paying extra (8-9%) for green schools. However, the small sample size for ASBO should be noted.

### **What initial cost difference would be acceptable to your district to get a green school?**

# *What are they saying?*

**From *Progress Report on Sustainability* - Building Design and Construction  
November 2004**

## *Progressive Districts Promoting High Performance Schools*

		Total	ASBO	CEFPI	NSBA
4-5	Top 2	81%	90%	82%	77%
3	Mid-range	14%	10%	14%	15%
1-2	Bottom 2	5%	-	4%	8%
Mean (scale of 5)		4.17	4.43	4.19	4.04
Base		433	30	301	102

All three groups of respondents showed a high level of support for sustainability in school construction.

**What level of consideration should be given to green design when a major project is being contemplated?**

	Total	ASBO	CEFPI	NSBA
Yes	75%	73%	80%	61%
No	3%	-	3%	3%
Not sure	22%	27%	17%	36%
Base	433	30	301	102

Three- fourths of all respondents (75%) see green schools as learning laboratories. "The science behind the design allows for real world examples of innovation and cost effectiveness for students, staff, and community," said one school board official.

**Can green buildings serve as a teaching tool?**

# And, if we know everyone involved in the design and construction of High Performance Green Schools are:

*Trustworthy*

*Loyal*

*Helpful*

*Friendly*

*Courteous*

*Kind*

*Obedient*

*Cheerful*

*Thrifty*

*Brave*

*Clean*

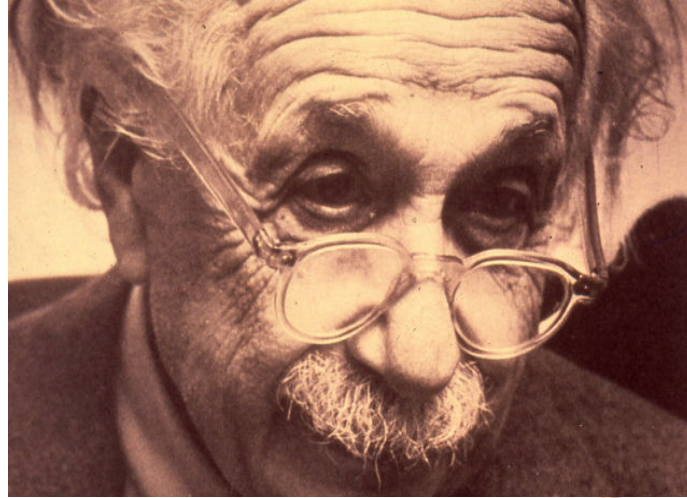
*Reverent*



*and maybe even LEED© accredited!*



# *Then what's the problem?*



*Several articles and numerous publications support the allegation that High Performance Green Schools are*

- more about people than buildings*
- more about commitment than committees*
- more about integrity than integration*
- more about our children's lives than life cycle cost*

# *What are they saying?*

From ***Building Healthy, High Performance Schools***  
***A Review of Selected State and Local Institutions***  
*The Environmental Law Institute*

## **What are some things we do we need to do?**




1. Approach the issues with a new mindset
2. Invest in a collaborative process
3. Avail ourselves of knowledge and feasibility of new materials, systems and tools
4. Integrate built environmental education via environmental education standards.
5. Use the most appropriate and effective ways to overcome client objections
6. Get beyond fixation with cosmetics and aesthetics
7. Overcome the persistent misconceptions of \$\$\$ versus the environment
8. Invest in the physical facility as part of the education delivery process

# ***What are they saying?***

**From *Building Healthy, High Performance Schools*  
A Review of Selected State and Local Institutions  
*The Environmental Law Institute***

## **What issues resonate most with the Progress on Sustainability report?**

- 1. The belief that high performance green schools are more expensive than conventional construction.**
  - 2. The perception that high performance green schools provide only marginal returns that cannot be verified**
  - 3. The belief that high performance green schools cannot be designed and constructed in ways that meet the pressure of increasing student populations and shifting demographics.**
- 





## Building Program\*

- Discharge no waste water, i.e. drinking water in, drinking water out
- Generate more electricity than it uses
- No materials that are carcinogenic, mutagenic or endocrine disrupters
- Use energy and materials efficiently
- Sustainably manufactured materials
- Landscape to promote biodiversity
- Promote ecological competence and be mindful of place
- Be genuinely pedagogical in design and operation
- Meet rigorous requirements for full cost accounting

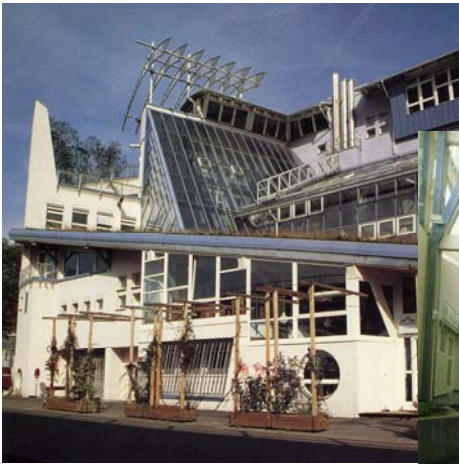
\* *The Nature of Design – Ecology, Culture and Human Intention* David Orr

Adam Joseph Lewis Center Oberlin College

*“In short, we have an obligation to equip our students to do the hard work ahead of... .\* ”*

- learning to power civilization by current sunlight
- reducing the amount of materials, water, and land use per capita
- growing food and fiber sustainably
- eliminating the concept of waste
- preserving biological diversity
- restoring ecologies ruined in the past century
- rethinking the political basis of modern society
- developing economies that can be sustained within the limits of nature
- distributing wealth fairly within and between generations

*\* The Nature of Design – Ecology, Culture and Human Intention    David Orr*





Building high performance schools today is essential for the future of our nation and its students.

If you do not begin today, you are mortgaging the future of your children and your grandchildren.

If you do not start now, when will you start?

THE FUTURE IS NOW

